

CONSUMER INFORMATION WORLD WIDE HARMONY?

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ABSTRACT

Consumer information programs around the world hold out the promise to assist consumers in vehicle purchase decisions by providing information on comparative safety features and performance. Programs in Japan, Australia, Europe, and the U.S. have been in place for many years. A primary focus of these programs has been to influence safety performance beyond what is regulated. However, none of these programs, individually or collectively, are providing the quality of information that consumers deserve or assuring that real world safety improvements for consumers are achieved.

The individual and collective value of these programs could be greatly improved by the development of a basic set of program criteria that would be followed uniformly by each program. This paper proposes program quality criteria that could be uniformly applied and suggests a mechanism by which the international community could review and adopt these criteria and any future criteria.

INTRODUCTION

When the term “consumer information” is used in motor vehicle safety, most people close to the subject associate the term with the various “NCAP” programs that have been developed in the various regions (U.S., Europe, Japan, Australia). In addition, other information separate from these programs is also available and differs from region to region e.g. testing by the Insurance Institute for Highway Safety (IIHS) in the U.S. These programs presume that the information being presented represents what consumers need to know to evaluate the safety of vehicles. What is clear is that actually very little research has been done to verify that the information being presented is what the consumer wants, would find useable, or is actually related to real world safety.

In the U.S., a study of consumer information programs was conducted by the National Academy of Science (NAS). The NAS study, “Shopping for Safety”, noted that for the U.S., “Little systematic information is available on what consumers believe or understand about vehicle safety...”. Absent such information, groups developing such information have the responsibility to make sure the interests of the public are primary. These groups have a responsibility to develop consumer information that informs and does not mislead the consumer. We believe that such definitive consumer research should be conducted. Until then, consumer information systems should strive to provide the consumer with meaningful, comprehensive information. The criteria that are outlined below are intended to meet that goal.

Additionally, in order to minimize confusion within a region or from region to region, it is important that the common criteria be adopted by all regions. Therefore a process should be established in the worldwide safety community to reach agreement on the common criteria, while allowing relevant regional differences to be recognized. The ESV forum here provides the opportunity for that common process to be initiated.

COMMON CRITERIA

The goals among the stakeholders in consumer information programs are not identical even though in many instances they contain common elements. We can assume, however, that some common goals each stakeholder should have are to improve the relevant safety information available to consumers and improve motor vehicle safety.

Not intending to exclude any group, this paper will be limited to focusing on the views of three primary “stakeholders”: the group generating the information, the vehicle manufacturers, and the consumer. While all should share the common goals of improving the safety information available to consumers and improving motor vehicle safety, they have some unique goals also. Clearly the groups generating the information want to influence customer choice and thereby ultimately influence vehicle design beyond that required by regulation. A primary method used by these groups is to develop systems that differentiate vehicle performance. Vehicle manufacturers want a process that allows them to

participate in the development of rating systems and to perform well in the ratings if they are accurate and meaningful. While research regarding what the customer wants is minimal, we believe customers want information that is accurate, relevant to safety, unbiased, timely, and readily available in an understandable format.

Considering the varied interests of these three groups, their efforts may not always reflect common goals. For example, attempts to differentiate performance may not always result in information that is relevant to safety. The criteria discussed below are intended to be a first proposal for further discussion within the international safety community. The proposed criteria closely follows the aforementioned “Shopping for Safety” study.

Open, inclusive process. Because of the potential importance of safety information to consumers and other affected parties, the process to determine relevant consumer information should include input from these groups. The process should involve all the stakeholders; consumers, vehicle manufacturers, government, researchers, policy specialists, safety specialists, and others so that the quality of the information is the best it can be. The current process in the U.S., where the primary consumer vehicle safety information is generated by the National Highway Traffic Safety Administration (NHTSA), has become similar to the rulemaking process. Any newly proposed consumer information element is published in the Federal Register for comments just like rulemaking. This allows interested parties to participate. However, unlike rulemaking, the NHTSA is under no obligation to accept or consider the comments received and there are no criteria the NHTSA is compelled to follow as they are in the rulemaking process (e.g., practicable, stated in objective terms, and meet the need for safety). In practice, NHTSA does consider the comments submitted. The other major consumer information program in the U.S. is sponsored by the IIHS. IIHS is considering a new side impact test/rating system, and indicates that it is also interested in engaging the broader technical community. The situation in the other global regions is less clear other than to state a process does exist and to some degree the manufacturers have input, but in a less formal way than may be present in the U.S.

Credible Source. Consumers want to be assured that the data or information being presented is credible. In most instances this may involve a qualified, independent “third party”. In the U.S., many consumers refer to the popular “Consumer Reports” magazine for information on products, including motor vehicles. Because this magazine gets no revenue from advertisements, it is perceived to be “independent” by consumers. Information generated by governments is also perceived to be independent and therefore credible.

Another attribute of such a credible source is the technical capability to generate the information accurately and correctly. If testing is involved, these sources must have the capability and capacity to assess enough vehicles so that conclusions represent the wide variety of vehicles in the marketplace. Absent the ability to do that, consumers will look for the information from other sources or infer performance from the incomplete information available. The trend to “certify” laboratories for such testing is helpful in this regard.

Vehicle manufacturers should also be considered as a potential source of such information and becoming “certified” should assure their public acceptance. The fact is that governments around the world already accept the manufacturer as a legitimate testing agency for certification, whether the vehicles are “type approved” or “self certified”.

Relevant to Real World Safety. This criterion is probably the most important and challenging of all. In the broadest sense, consumer information programs should embrace all aspects of real world safety and present the information in a way that the actual safety relevance of the information can be quantified. In the U.S., as motor vehicle safety was emerging as a public issue and Federal regulations were emerging, the first Director of the National Highway Safety Bureau (NHSB) – the precursor to the NHTSA – developed what has been commonly called the Haddon matrix. This matrix attempts to simply characterize the issue of motor vehicle safety into the 3x3 matrix shown on the following page.

	Human	Environment	Vehicle
Pre-crash			
Crash			
Post-crash			

Figure 1. Haddon Matrix

Vehicle safety in this matrix is divided into three components: pre-crash, crash, and post-crash. If these are important elements in vehicle safety, then consumer information systems should attempt to address each in a relevant way. Most current consumer information programs focus primarily on the Vehicle-Crash cell in the matrix. This is because vehicle evaluation is more developed in crash testing, generating more consumer information in this area than the others. It is ironic that most of the information being generated for consumers is in the area that, from an absolute safety perspective, is one of the least important. This is not to imply that crashworthiness (passive safety) is not important, but if consumers are to be fully informed with information that affects their safety in the driving environment, other information is also relevant. Consumer decisions, other than vehicle choice, have a much more profound effect on their safety than does the vehicle. Simple choices, such as not drinking and driving, pulling off the road when drowsy, or wearing the available restraints, influence an individual's safety much more than vehicle features or performance. In the choice of vehicle, the first order selection that influences safety is the size and mass of the vehicle. Current consumer information programs recognize this, but do not quantify the importance of mass and size. Consumers are instructed to compare data from vehicles in the same weight class – leaving unanswered the question of how safety is affected if a different weight class is chosen. The “Shopping for Safety” study recognized this as an essential element to be included in a meaningful consumer information program.

With the premise that, without a clear indication from consumers what information is important to them, and consistent with the “Shopping for Safety” study, consumer information programs should provide information in all three Vehicle areas of the Haddon matrix.

Pre-Crash (Active) Safety. The ability to avoid a crash offers the most potential for

improving safety in any region in the world. In the U.S., a study done in the mid-70's by Indiana University, known as the Indiana Tri-Level Study indicated that human error is the primary cause of crashes and that the vehicle itself is a rare cause of a crash. That fact notwithstanding, there are systems on the vehicle which can greatly improve the drivers probability of avoiding a crash. Basic operating systems such as brakes, steering, lighting, and visibility offer such potential and consumer information should, to the extent possible, assess vehicle performance in these areas. Of course, new active systems that now beginning to appear (e.g. active chassis control) should also be comprehended.

Currently, only the Japanese NCAP system which addresses braking, and the U.S. NCAP, which publishes a rollover metric, attempt to provide information in this area. NHTSA is considering evaluating both braking and lighting in the future. In those areas in which performance can be quantified, such as braking and lighting, stakeholders should determine which metrics are relevant and provide the customer with that information. In lieu of measures that can be quantified, information on crash avoidance features should be identified, including the aspect of performance the feature addresses, as well as instructions as to how to use the feature. Again the current Japanese NCAP is most comprehensive in this area. The NHTSA “Buying A Safer Car” booklet does list some of these features but with little instruction regarding their proper use. Owner's manuals provided by the manufacturers actually offer the most comprehensive information in this area.

Crash (Passive) Safety. The total harm associated with motor vehicle crashes is the result of the multitude of crash types and severities. In theory, consumer information programs would address as much of the harm associated with crashes as possible. Current regulatory crash tests and consumer information driven tests are attempts to define tests that represent a significant portion of that harm. A desirable goal for a consumer information program is to address the types of collision events that capture a significant part of the harm occurring in the field. Therefore the relevance of the test types and severity selected is essential. As essential to the selection of the tests (and the accompanying metrics) is information regarding the relevance of the tests. Current NCAP

programs address this in varying ways. The “Shopping for Safety” study indicated that consumers need both an overall “score” or rating if various tests are used, and an indication of the relative contribution of each test.

Currently, the Japanese NCAP provides the most comprehensive attempt at the overall metric by combining the results of three current crash tests –the full frontal barrier, the offset barrier, and the side impact test. The combination is based on weighting both the contribution of each body region in the separate tests as well as the weighting of the three tests. The weighting is based on the field crash experience in Japan.

The EuroNCAP also has an overall score for the crashes conducted (offset frontal and side impacts) and includes additional credit if the side pole test results are included. EuroNCAP has not done the weighting similar to Japan or to the suggestion of a similar weighting scheme developed in Europe..

Another aspect of the relevance of “weighting” the crashes, based on the field relevance of the crash event being simulated, is that the addition of any test must be considered relative to other similar types of tests. The sum of the real crash harm being represented by the tests conducted cannot exceed the total harm of all crashes. For example, the Japanese NCAP correctly distributes the harm associated with frontal collisions between the full frontal test and the offset test. As the IIHS proceeds with its development of an additional side impact test, its relevance must be considered in the context of the already present side impact test that occurs in both the LINCAP as well as the EuroNCAP. Of course, the total harm represented by the two types of side impact tests cannot be any more than the total harm associated with side impacts in general. The results of each test should be weighted according to its contribution to the total harm of all side impact events.

The selection of the correct occupant body regions and injury criteria is an integral part of the crash evaluation in any system. Efforts underway through ISO and other international forums are intended to provide the process for agreement on this element of the criteria.

In the assessment of crashworthiness, the vehicle attributes of mass and geometry must be accounted for if meaningful comparisons are to

be made between all vehicles. Consumers should understand explicitly that occupant safety is influenced more by moving from one vehicle class to another than by selecting from vehicles within the same class. Quantifying the magnitude of these differences is essential for accurate and complete consumer information in this area.

In those areas of crashworthiness where quantifiable metrics are not available, information to the consumer regarding the presence of a specific feature and its correct use will also prove useful e.g. how to properly adjust head restraints.

Post-crash factors. The final element in the Haddon matrix is the post-crash cell. Elements of performance in this area include such things as door openability, fuel system integrity, and post crash notification. Currently, door openability is assessed in some programs as well as fuel system integrity. Post crash notification, which could be critical to harm reduction in certain instances is not evaluated in any program currently. What may not be addressed is these measure’s relevance to the other aspects of vehicle performance.

Accurate Information. One important aspect of accurate information is that it should be stated in objective terms. Obviously test data would meet this criterion, assuming the organization generating the information meets the above described criterion of a “Credible Source”. Meeting this criterion also requires an explanation of the limitations of the information and the possible variation in the results. This variation has always been a concern in those aspects of performance which are predicated on a single test of a single vehicle. Vehicles that come close to the border of two ratings can suffer or benefit from this variability. Informing customers of this variability would be helpful and put the ratings into a more relevant perspective.

In those areas where no testing is available, but specific features are present that are designed to address the vehicle performance in the Pre-crash, Crash, or Post-crash areas, these features should be described accurately and, to the extent possible, indicate the safety relevance of the feature. For example in the Pre-crash area, vehicles with Daytime Running Lights (DRL’s) should be noted with the expected field benefit

quantified (e.g. a 5-10% reduction in relevant two vehicle crashes).

Understandable, common format.

Information that consumers don't understand is not useful and may be confusing or misleading. For example the recent publication of the Static Stability Factor (SSF) by the NHTSA caused confusion in the media and subsequently in the public because it was a static metric that attempted to quantify a dynamic event. The popular press, broadcast media, and the public were left with the impression (video was shown) that the rating related to a dynamic event and quantitatively, those vehicles with a 1 star rating had a 40% chance of rolling over. This is not the information that was conveyed by NHTSA, but this is one way that it was interpreted – clearly this metric missed the mark for being understandable or meaningful.

Currently all the major consumer information systems in the world use different formats in presenting the information. While the U.S. and Europe use a “star” format, the bases for the stars are different and the number of stars is not equivalent. Until recently, the U.S. had a 5 star system and the Europeans a 4 star system. Europe recently moved to a 5 star basis with the addition of the side pole test. Japan uses an alphabetic system (AAA-D). Chances of the consumer reconciling these various systems, which are linked on the Internet, even if the test protocols were similar, are unlikely.

The attempts by some of the consumer information systems to provide an overall rating is a recognition that consumers may not be willing to invest the time to investigate all the details of the rating elements and want to get to a summary measure. This is perhaps why Consumer Reports in the U.S. distills its comprehensive objective and subjective evaluations of the various products into a “Best Pick”. The casual consumer is quickly informed by this overall metric. A goal of any vehicle consumer information program should be to agree with the NAS recommendation for a summary measure with the supporting detailed information also available.

Also in those areas where tests are not run and quantitative data not available, the list of features in the particular vehicle should be described in simple terms. Vehicle manufacturers take great care in the descriptions of such features in their

owner's manuals. This same care should be available in the consumer information programs.

Valuable to Consumers. As noted previously, this is an area where further research is needed. At this time all consumer information programs are based on the premise that the information provided is what the consumer wants and needs. Little data are available to verify this. Consistent with the recommendations of others, until we can identify specific consumer wants and needs, providing more, rather than less information, is appropriate. For example if customer research indicated that personal security was an important element of vehicle safety, information in that area should be provided. Conversely, if consumers believe that the braking performance of vehicles, as identified by the current regulations is sufficient, efforts to generate information in this area would not be necessary.

Another aspect of value to the customer is the timeliness of the information. For new vehicle purchasers, it is important that the information be provided before the purchase. Programs that depend on testing production vehicles may have a time lag between the time the vehicle is publicly available and the test results are available. This can be due to many factors including vehicle availability, test facility capacity, budget constraints etc. Proposals to use manufacturer data, generated during the compliance process (for self-certification), offers the opportunity to address this more effectively. This proposal also suggests that using a “margin of compliance” could also reduce the need for additional testing in those areas of performance that are addressed in the regulations. If the standards have been established to be “relevant to motor vehicle safety”, then assessment of the vehicles to those levels of performance would be more appropriate that creating a different level of testing that has not been established to be relevant.

Additionally, in these areas of performance that are now subject to regulation, performance judged on a “margin of compliance” basis, correctly suggests that performance will range from “good” (already meets the relevant regulation) to “better” depending on the exceedance to the requirements of the regulation involved. It may be confusing and misleading to the public to suggest a “poor” performing vehicle in a test that is similar to a compliance test

(which the vehicle must meet to be sold). It is also confusing to the public to have a “poor” performing vehicle (implicitly or explicitly) when the level of safety provided is acceptable by other measures in the same aspect of performance.

Finally, all the information must be readily available to the customer. Most information is readily available from the various NCAP programs on the Internet for those who are interested and have Internet access. Other means of distribution include free of charge booklets and brochures. Some delivery systems fall short in that you must pay for the information, or information on all of the vehicles is not presented at the same time, reducing the customers ability to properly assess the vehicle’s performance relative to other vehicles.

Stimulates customer behavior change. The goal of providing consumer information should be to not only inform the customer, but to influence choices. The extensive efforts to generate and publish this information are wasted

if consumers do not find it valuable or ignore it. Little information is available to assess what effects these programs are having on consumer choices. Each program, as part of its own self-assessment and development, should have an ongoing effort to measure this aspect of their system. We know from surveys in the U.S. that most customers don’t know what NCAP is or what it represents. We do know that customers consider safety in their purchase decision, but until we know what they mean by “safety” and the type of information they will perceive as valuable, we may be committing significant resources with little known about the effects on consumer choice of those programs.

COMMON CRITERIA – SUMMARY

The criteria described above can be summarized in Table 1. This table provides a comparison of how each current NCAP system (Japan, Europe, U.S., IIHS) address these criteria. It is clear from reviewing this table that these programs recognize to some degree, either implicitly or





<div>   CONSUMER INFORMATION   </div>				
Current Status				
Criteria	NCAP	EURONCAP	JNCAP	IIHS
Credible Source	Government Contractors	Approved Laboratories	JARI	IIHS
Relevant To Real World Safety				
Crashworthiness	Front Barrier, Side, Limited IARV's	ODB, Side, Pedestrian, CRS, Side Pole, Extensive IARV's	Front Barrier, Side, ODB, limited IARV's	ODB, extensive IARV's measures
- Vehicle				Head Restraints
- Behavior	CRS, Belts, Head Restraints	None Given	CRS, Belts, Airbags	None Measured
Crash Avoidance				
- Vehicle	None Mentioned	None Given	Brake (wet & dry)	None given here
- Behavior	ABS, Traction Control, DRL, Mirror	None Measured	ABS, Cellphone, Brake Assist Navigation, Stability Control	None given here
Post Crash	Fuel System	Doors (Text)	Doors, Extrication, Fuel System	Subjective review
Vehicle Attributes (size, weight)	Implied - Vehicle classes	Implied - Vehicle classes	Implied - Vehicle classes	Implied - Vehicle classes
Accurate				
Objective Measures	Test Data, Only 1 Test	Test Data, some subjective (modifiers), 1 Test	Test data, only 1 Test	Test data, some subjective, 1 test
Features List	19 CA & CW Listed	None Listed	9 CA & CW Listed	None mentioned here
Understandable Format				
-Simple Metrics	Stars (1 - 5)	Stars (1 - 5)	AAA →D, colored symbols	Good →poor, colored symbols by reference
-Simple Features Description	Words with graphics	None mentioned	Words with graphics	None mentioned
-Overall Rating	No, separate front & side	Front & Side combined, Pedestrian separate	Yes, Frontal, ODB, Side combined	Yes-combine Structure, Injury, Head Restraint, Bumper
Valuable To Customers				
-Meets Customer Expectations	Survey indicates unaware	?	?	?
-Timely	Current vehicle classes	Current Vehicles	Current Vehicles	Current Vehicles
-Adequate Delivery System	Hotline, Kiosks, Website Regional Offices	Brochures, Website, other ?	Brochures, Website, other ?	TV, print media, brochures Website
Stimulates Customer Behavior Change				
-Buying Behavior	?	?	?	?
-Driving Behavior	?	Not Addressed	?	Not Addressed

Table 1 Criteria Summary

explicitly, the value of the criteria discussed above. It is also clear they are not consistent in their approaches. A concerted effort to recognize and address these criteria should result in the stated goal of high quality, harmonized programs throughout the world.

COMMON HARMONIZED PROCESS

The suggestion for harmonization of the various consumer information programs is not new. Nearly a year ago at the Crash-Tech Conference in Munich, the idea of “Global NCAP Harmonization” was presented. Many of the concepts presented in this paper were discussed in that forum. The discussions at that time involved the specific details of a harmonized system, including a detailed mathematical formula to deal with the integration of the data from the various tests that were recommended. These proposals form an excellent basis to formulate further improvements in the design of the specific consumer information programs.

As important as the specifics of the program, a process was recommended to pursue developments in this area. Specifically the recommendation was made to use the ESV process, and more specifically the creation of an IHRA on Consumer Information that would provide an international forum for that future development. This paper is intended to provide further substantiation and endorsement to that recommendation.

Finally, one concern with the recommendation of using the IHRA process is that it is controlled by the various governments in the regions represented. However, many of the existing IHRA’s have been inclusive in their engagement of the rest of the scientific community. It is essential that the process be open and inclusive for it to have the quality characteristics suggested here. The existing IHRA framework, if structured to assure inclusion, offers a preferable process to creating a new process at this time.

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